

**Claims**

1. Method for fault detection in a power transformer/-  
autotransformer and/or interconnected power lines, which are  
5 within the zone protected by the differential protection,  
and particularly suitable for detecting turn-to-turn faults  
in power transformer/autotransformer windings,  
**characterized by,**

- 10 - measuring all individual instantaneous phase currents of  
the protected object,
- calculating individual phase currents as fundamental  
frequency phasors,
- calculating the contributions of the individual protected  
object sides negative sequence currents to the total  
15 negative sequence differential current by compensating for  
the phase shift of a power transformer within the protected  
zone,
- comparing the relative positions of the compensated  
individual sides negative sequence currents in the complex  
20 plane, in order to determine whether the source of the  
negative sequence currents, i.e. the fault position, is  
within the protected zone or outside of the protected zone,  
delimited with current transformer locations,
- disconnecting the protected object if determined that the  
25 source of the negative sequence currents is within the  
protected zone.

2. Device for detecting a fault in a power transformer,  
autotransformer or interconnected power lines, which are  
30 within the zone protected by the differential protection,  
and particularly suitable for detecting turn-to-turn faults  
in power transformer/autotransformer windings,

characterized by having,

- means for measuring all individual instantaneous phase currents of the protected object,
- 5 - means for calculating individual phase currents as fundamental frequency phasors,
- means for calculating the contributions of the individual protected object sides negative sequence currents to the total negative sequence differential current by compensating
- 10 for the phase shift of an eventual power transformer within the protected zone,
- means for comparing the relative positions of the compensated individual sides negative sequence currents in the complex plane, in order to determine whether the source
- 15 of the negative sequence currents, i.e. the fault position, is within the protected zone or outside of the protected zone, delimited with current transformer locations,
- means for disconnecting the protected object if determined that the source of the negative sequence currents is within
- 20 the protected zone

3. Device according to claim 2,  
characterized by that,  
a fault discriminator is included, that is arranged to  
25 determine when a fault occurs.

4. Device according to claim 2 or 3,  
characterized by that,  
a fault discriminator is included, that is arranged to  
30 determine if the fault is internal or external.

5. A computer program comprising computer program code means for carrying out the steps of a method according to claim 1.

6. A computer readable medium comprising at least part of a  
5 computer program according to claim 4.

7. A computer program, according to claim 4, that is, at least partially, provided through a network, such as e.g. internet.